SEP 2 2 1990

FLOOD INSURANCE STUDY

DAWSON COUNTY, GEORGIA

UNINCORPORATED AREAS

DECEMBER 15, 1990

Federal Emergency Management Agency

COMMUNITY NUMBER - 130304

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
	1.1 Purpose of Study	1
	1.2 Authority and Acknowledgments	1
	1.3 Coordination	1
2.0	AREA STUDIED	2
	2.1 Scope of Study	2
	2.2 Community Description	2
	2.3 Principal Flood Problems	4
	2.4 Flood Protection Measures	4
3.0	ENGINEERING METHODS	4
	3.1 Hydrologic Analyses	5
	3.2 Hydraulic Analyses	6
4.0	FLOODPLAIN MANAGEMENT APPLICATIONS	7
	4.1 Floodplain Boundaries	7
	4.2 Floodways	8
5.0	INSURANCE APPLICATION	8
6.0	FLOOD INSURANCE RATE MAP	9
7.0	OTHER STUDIES	9
8.0	LOCATION OF DATA	9
9.0	REFERENCES AND BIBLIOGRAPHY	10

TABLE OF CONTENTS (continued)

Page

FIGURES

Figure 1 - Vicinity Map 3

TABLES

Table 1 - Summary of Discharges 6

EXHIBITS

Flood Profiles

Etowah River	Panels 01P-05P
Black Mill Creek	Panels 06P-09P
Mill Creek	Panel 10P

Flood Insurance Rate Map Index
Flood Insurance Rate Map

Elevation Reference Marks

FLOOD INSURANCE STUDY

DAWSON COUNTY,
UNINCORPORATED AREAS,
GEORGIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Unincorporated Areas of Dawson County, Georgia, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Post, Buckley, Schuh & Jernigan, Inc. (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Contract No. EMA-86-C-0113. This study was completed in December 1988.

1.3 Coordination

A community coordination meeting was held on October 14, 1986 and was attended by representatives of FEMA, Dawson County and the Study Contractor. The primary purpose of this meeting was to identify streams requiring detailed study.

On January 29, 1990, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the Unincorporated Areas of Dawson County, Georgia. The area of study is shown on the Vicinity Map (Figure 1).

Flooding caused by overflow of the Etowah River, Mill Creek and Black Mill Creek was studied in detail.

Areas having low development potential or minimal flood hazards were previously studied using approximate analyses. The results were shown on the Flood Hazard Boundary Map for Dawson County (Reference 1) and is incorporated into this Flood Insurance Study.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through October 1993. The scope and methods of study were proposed to and agreed upon by FEMA and Dawson County.

2.2 Community Description

Dawson County, encompassing 210 square miles, is in northcentral Georgia, approximately 31 miles north of Atlanta. It is bordered by Gilmer, Fannin and Lumpkin Counties, Georgia, on the north; Hall County, Georgia, on the east; Forsyth County, Georgia, on the south; and Cherokee and Pickens Counties, Georgia, on the west. State Routes 9, 53, 136, and 400 provide Dawson County with major transportation links to the City of Atlanta and surrounding communities. The 1980 population of Dawson County was reported to be 4,774 (Reference 2).

Dawson County was established in 1857; formed from parts of Forsyth, Gilmer and Lumpkin Counties. The City of Dawsonville is the County Seat. The economy is supported by fabricating, finishing, forming and machining.

The county's topography is typified by steep terrain. Elevations vary from approximately 1,200 feet to 3,000 feet National Geodetic Vertical Datum of 1929 (NGVD). Of the more than 22 soil types in the county, four pose severe limitations to development: gullied land with severe erosion, rocky terrain, soils with excessive slope, and floodplain soils.

Located along the southern slopes of the Blue Ridge Mountains, Dawson County has mild winters and warm summers. The average annual temperature is 70 degrees Fahrenheit (^{O}F). Summer temperatures average 90^{O}F and winter temperatures average 32^{O}F (Reference 3). Rainfall averages 60.91 inches annually (Reference 4).

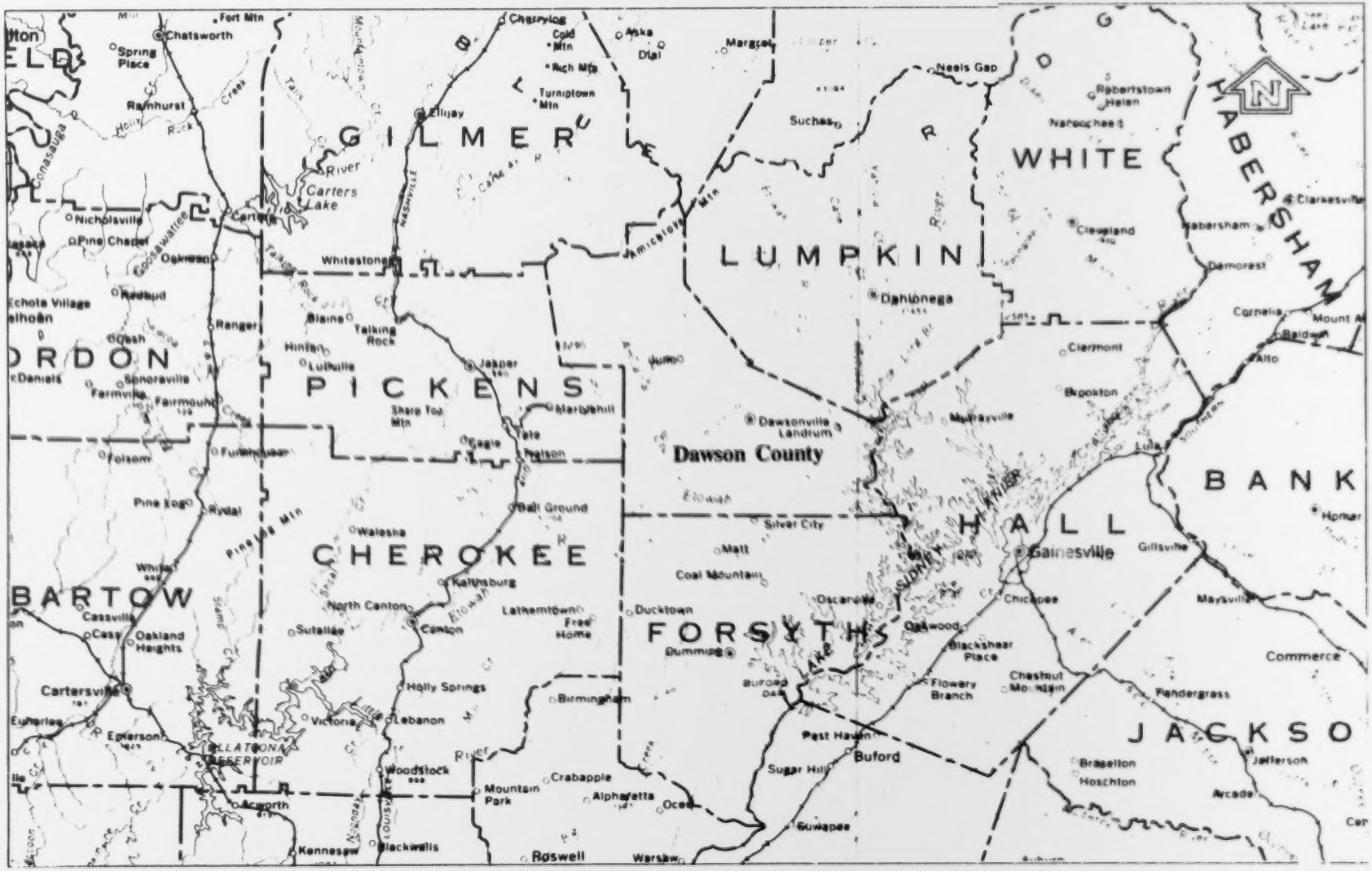


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

APPROXIMATE SCALE

8 0 8 16 24 MILES

VICINITY MAP

A small portion of the county's watershed, located in the southeastern corner drains east into Lake Sidney Lanier and enters the Chattahooche River drainage basin. The majority of the tributaries flow into the Etowah River which eventually flows into the Coosa River drainage basin.

2.3 Principal Flood Problems

Most of the flood problems existing in the study area are in low lying agriculture areas. Localized flooding in certain areas not identified in this study may exist.

2.4 Flood Protection Measures

There are eleven watershed control structures in Dawson County which fall under jurisdiction of the U.S. Department of Agriculture's Soil Conservation Service (SCS). Of these eleven structures, four occur within the upstream drainage basin of the study area. Although it is believed that these structure may provide some measure of downstream flood attenuation for the higher frequency events (lower floods), they are not believed to provide significant attenuation for the 100-year and 500-year floods studied, herein. Therefore, no routings or detailed analysis of storage effects in these reservoirs were performed in conjunction with this technical analysis.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 100-, and 500-year floods, have a 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40-percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60-percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

A gaging station (No. 02389000) located on the Etowah River near Dawsonville, Georgia, intercepts a drainage area of approximately 107 square miles and has a period of record from 1940-1982. The Log Pearson Type III distribution was used to determine peak discharges in accordance with the procedures in Bulletin 17B (Reference 5).

Peak discharges determined in this manner were then weighted with peak discharges computed to this site using the regression equations. In applying the regression equation an accounting was made for the fact that the Etowah River forms the division line between hydrologic regions (Region 1 lies to the north and Region 2 to the south of Etowah River). After determining the weighted discharges at the gage, these values were transposed downstream to the ungaged sites (nodes) in the study in accordance with the procedures in Water Resources Investigation (WRI) 78-137 (Reference 6).

No gaging stations are located on Mill Creek or Black Mill Creek. Discharge-frequency relationships on these two streams were determined using the USGS regional regression equations (Reference 6). For areas where significant urbanization has occurred, these rural discharges were adjusted (Reference 7).

The three-parameter estimating equations were used in this flood study. The three-parameters used in the regression equations are the previously determined rural discharges, the drainage area, and the basin development factor (BDF) which is a measure of the efficiency of the drainage system. Discharges were computed at specific locations or nodes by determining the contributing drainage area at that point and applying the techniques outlined above. Nodes were established at points of major inflow. Drainage areas were measured from topographic maps (Reference 8). BDFs were assigned based on aerial photos and information gathered during field reconnaissance.

Peak discharge-drainage area relationships for the 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 100-YEAR	500-YEAR
ETOWAH RIVER			
at State Route 9	131.2	12,573	16,287
about 0.70 mile upstream of confluence of Black Mill Creek	123.8	11,263	14,401
about 800 feet upstream of confluence of Mill Creek	119.0	10,393	13,160
about 2,100 feet downstream of County Route 248	115.8	9,813	12,332
about 2,800 feet downstream of State Route 53	112.6	9,276	11,567
about 0.66 mile downstream of confluence of Palmer Creek	107.5	8,403	10,330
MILL CREEK			
at mouth	2.8	1,229	1,652
BLACK MILL CREEK			
at mouth	7.8	2,677	3,683
about 2,500 feet downstream of confluence of Route 115	3.8	1,845	2,555
about 1.53 miles upstream of confluence of Route 115	2.3	1,386	1,929

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Overbank cross sections for the backwater analyses of the streams studied in detailed methods were obtained from aerial photography (Reference 9). The below-water sections were obtained by field measurement at bridge structures and interpolated or estimated

between structures. All bridges, dams and culverts were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and on the Flood Insurance Rate Map.

Roughness coefficients (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas. The roughness value used for the stream channels ranged from 0.035 to 0.06. Roughness values for overbank areas ranged from 0.06 to 0.15.

Water-surface elevations of floods of the selected recurrence intervals were computed using HEC-2 step back-water computer program (Reference 10). Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for the streams studied were calculated using the slope-area method.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the NGVD. Elevation reference marks used in this study are shown on the map and described in the exhibit labeled Elevation Reference Marks.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 20 feet (Reference 8).

The 100-year and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

Floodways have not been shown or computed for this community. Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplain will not cause more than a 1.0-foot increase in the base flood elevations at any point within the community.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where

the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

The Flood Insurance Studies published for Cherokee, Forsyth, and Hall Counties (References 11-13) agree with this study.

The Flood Insurance Rate Maps printed for Pickens County and the City of Dawsonville (References 14 and 15) agree with this study.

The Flood Insurance Studies in progress for Gilmer and Lumpkin Counties, Georgia (References 16, 17) agree with this study.

This Flood Insurance Study supersedes the previously printed Flood Hazard Boundary Map for Dawson County, Georgia (Reference 1).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 1371 Peachtree Street, NE., Suite 736, Atlanta, Georgia 30309.

Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To ensure that any user is aware of all revisions, it is advisable to contact the map repository of flood hazard data located in the community.

9.0 REFERENCES AND BIBLIOGRAPHY

1. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Dawson County, Unincorporated Areas, Georgia, June 1976.

2. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Georgia, Washington, D.C., January 1982.

3. ----------, National Oceanic and Atmospheric Administration, Environmental Data Services, Climatological Data for Georgia, Asheville, North Carolina.

4. ----------, National Weather Service, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D.C., January 1963.

5. U.S. Department of the Interior, Geological Survey, Interagency Advisory Committee on Water Data, Office of Water Data Coordination, Hydrology Subcommittee, Bulletin No., 17B, Guidelines for Determining Flood Flow Frequency, September 1981, revised March 1982.

6. ----------, U.S. Geological Survey, Water Resources Investigation 78-137, Floods in Georgia, Magnitude and Frequency; Techniques for Estimating the Magnitude and Frequency of Floods in Georgia with Compilation of Flood Data through 1974, McGlone Price, October 1979.

7. U.S. Geological Survey, Water Supply Paper 2207, Flood Characteristics of Urban Watersheds in the United States, Techniques for Estimating Magnitude and Frequency of Urban Floods, U.B. Sauer, W.O. Dawson, Jr., V.A. Stricker, and K.V. Wilson, 1983.

8. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 20 feet, Chestatee, Georgia, 1973; Coal Mountain, Georgia, 1985; Dawsonville, Georgia, 1964.

9. Woolpert Consultants, Aerial Photographs, Dawson County, Georgia, Scale 1:14400: Mobile, Alabama, 1986.

10. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, April 1984.

11. Federal Emergency Management Agency, Flood Insurance Study, Cherokee County, Unincorporated Areas, Georgia, July 1988.

12. ----------, Flood Insurance Study, Forsyth County, Unincorporated Areas, Georgia, July 1989.

13. ----------, Flood Insurance Study, Hall County, Unincorporated Areas, Georgia, November 1983.

14. ----------, Flood Insurance Rate Map, Pickens County, Unincorporated Areas, Georgia, July 1987.

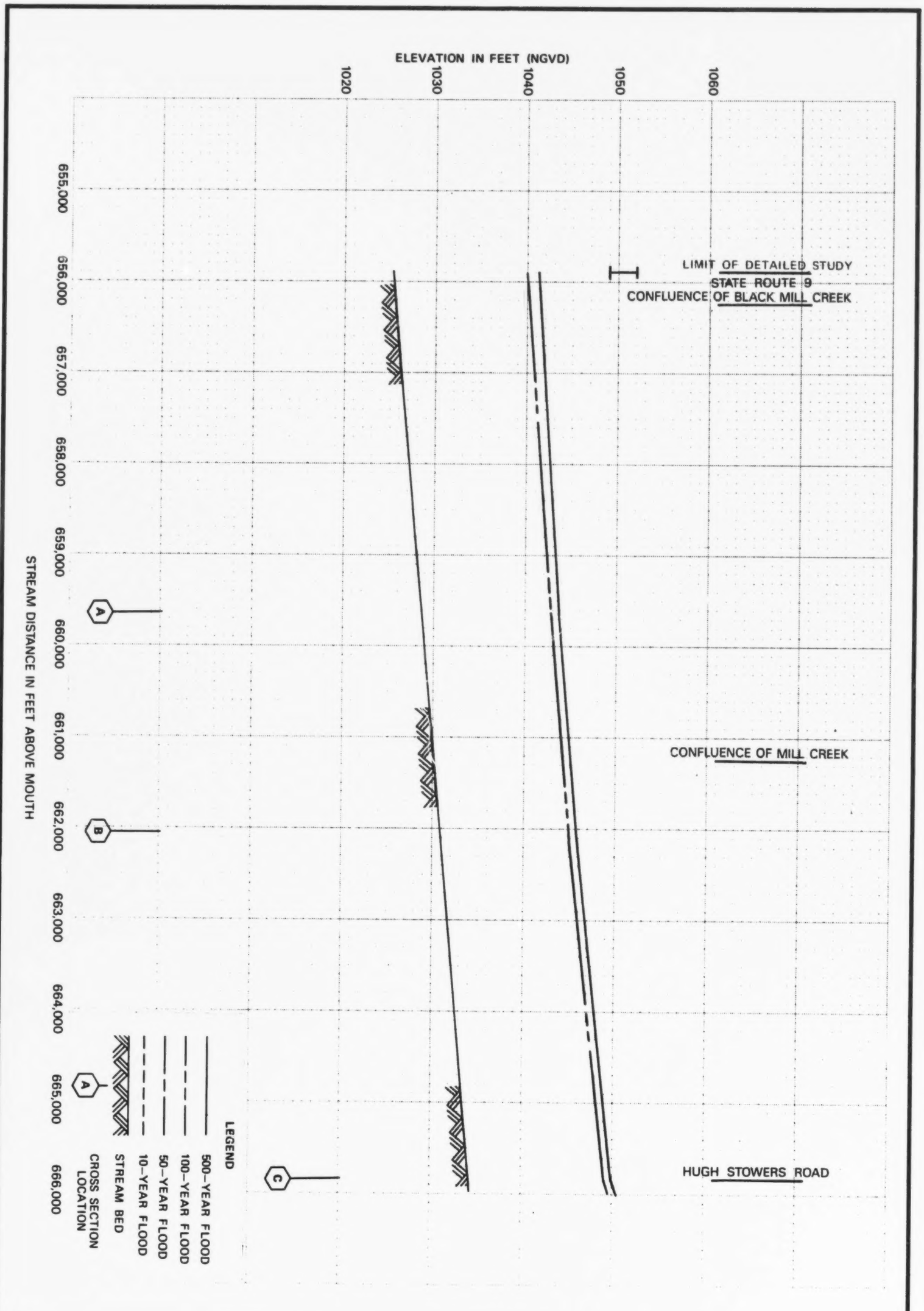
15. ----------, Flood Insurance Rate Map, City of Dawsonville, Dawson County, Georgia, May 1982.

16. ----------, Flood Insurance Study, Gilmer County, Unincorporated Areas, Georgia, in progress.

17. ----------, Flood Insurance Study, Lumpkin County, Unincorporated Areas, Georgia, in progress.

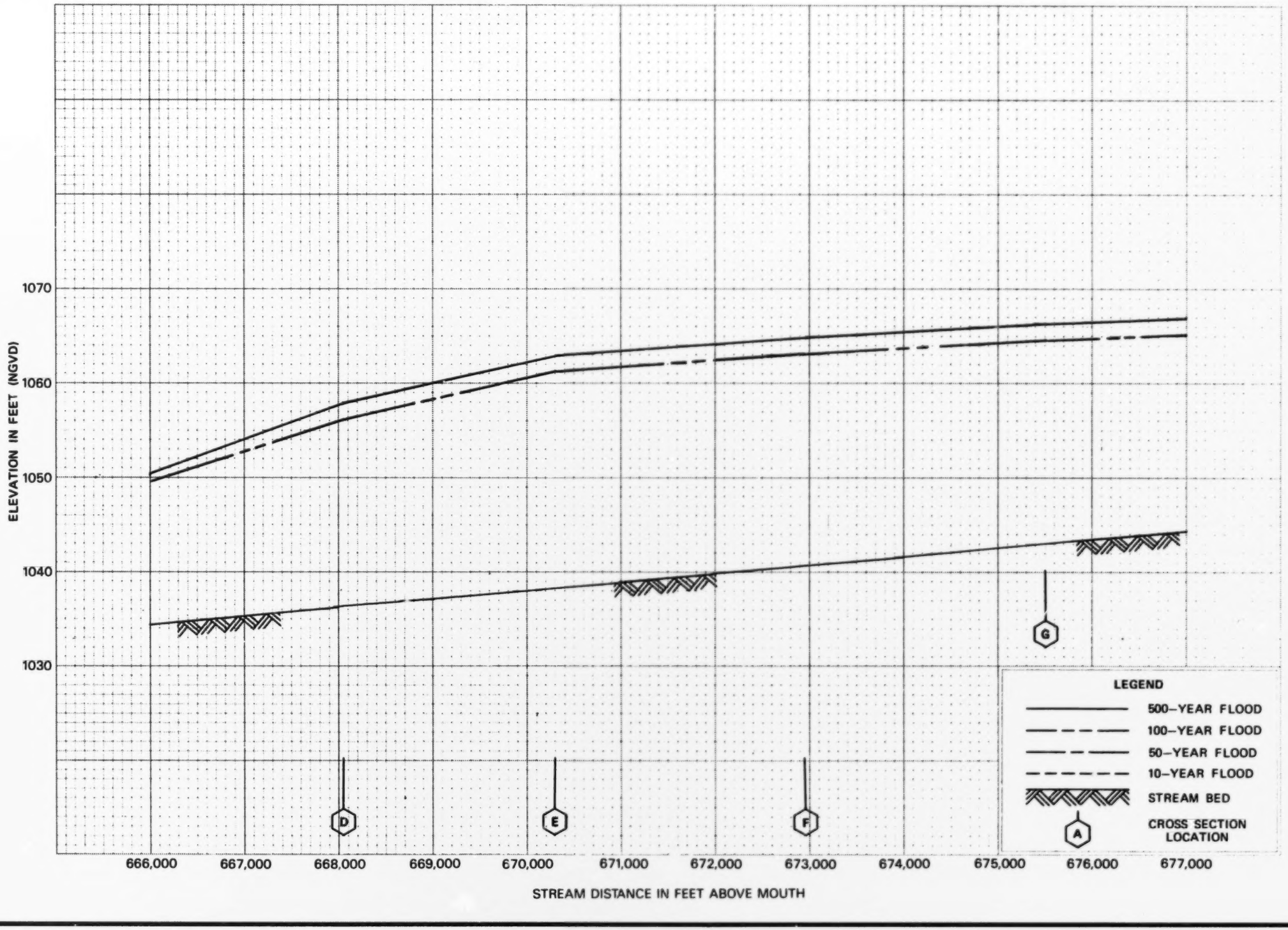
ELEVATION REFERENCE MARKS

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1	0175	1,056.10	chiseled cross on top of concrete guardrail on southeast corner of State Route 9 bridge over the Etowah River
2	0175	1,057.21	chiseled cross on top of headwall on northeast corner of culvert for Black Mill Creek under Dawson Forest Road
3	0175	1,105.90	chiseled square in wood beam on southeast corner of County Road 115 bridge over Black Mill Creek
4	0125	1,067.99	chiseled cross on top of headwall on northeast corner of culvert for Mill Creek under Thompson Road
5	0125	1,071.74	standard DOT brass disk on concrete curb on northwest corner of State Route 53 bridge over the Etowah River



13

01P	FEDERAL EMERGENCY MANAGEMENT AGENCY **DAWSON COUNTY, GA** (UNINCORPORATED AREAS)	**FLOOD PROFILES** **ETOWAH RIVER**



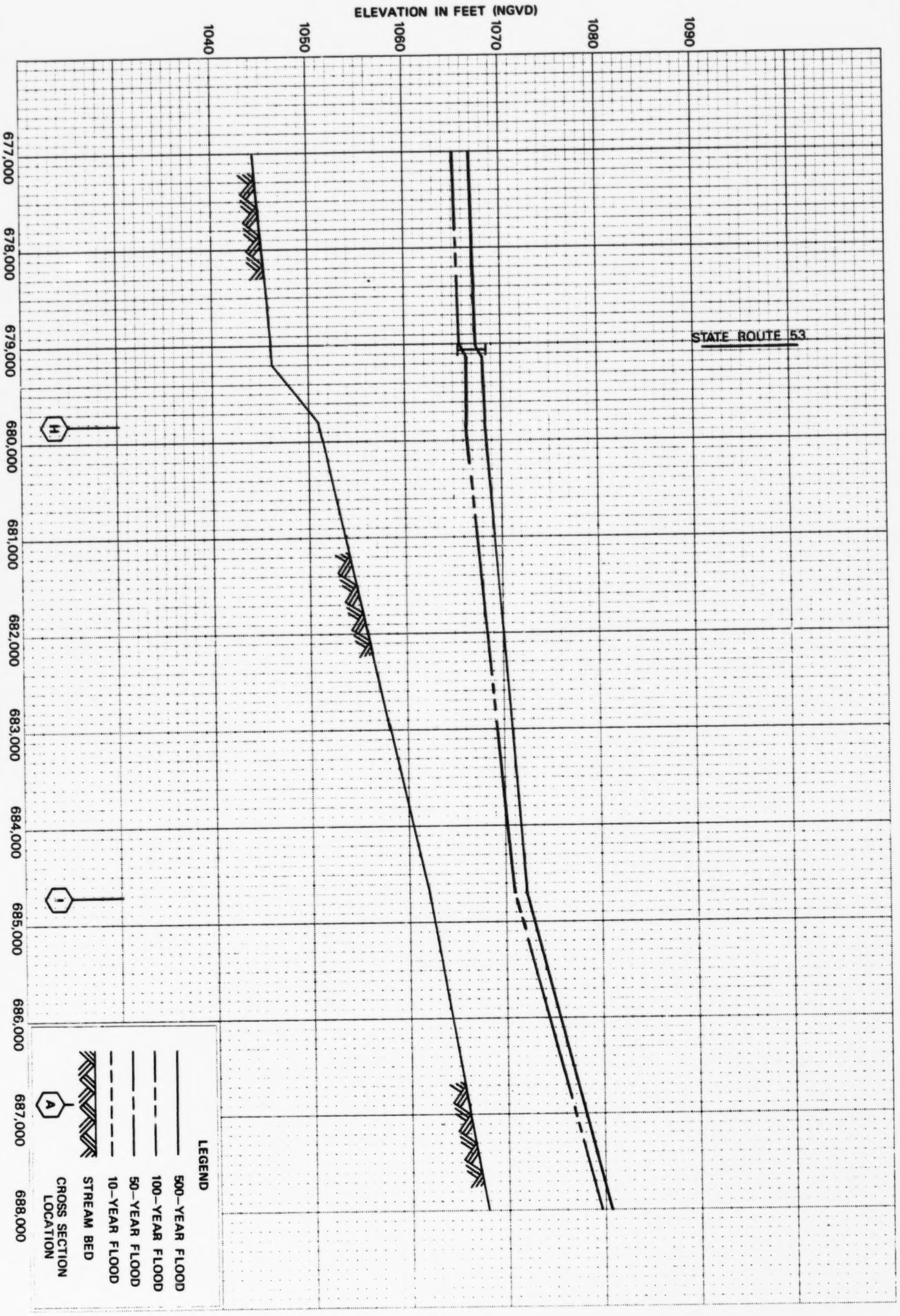
FLOOD PROFILES

ETOWAH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

02P



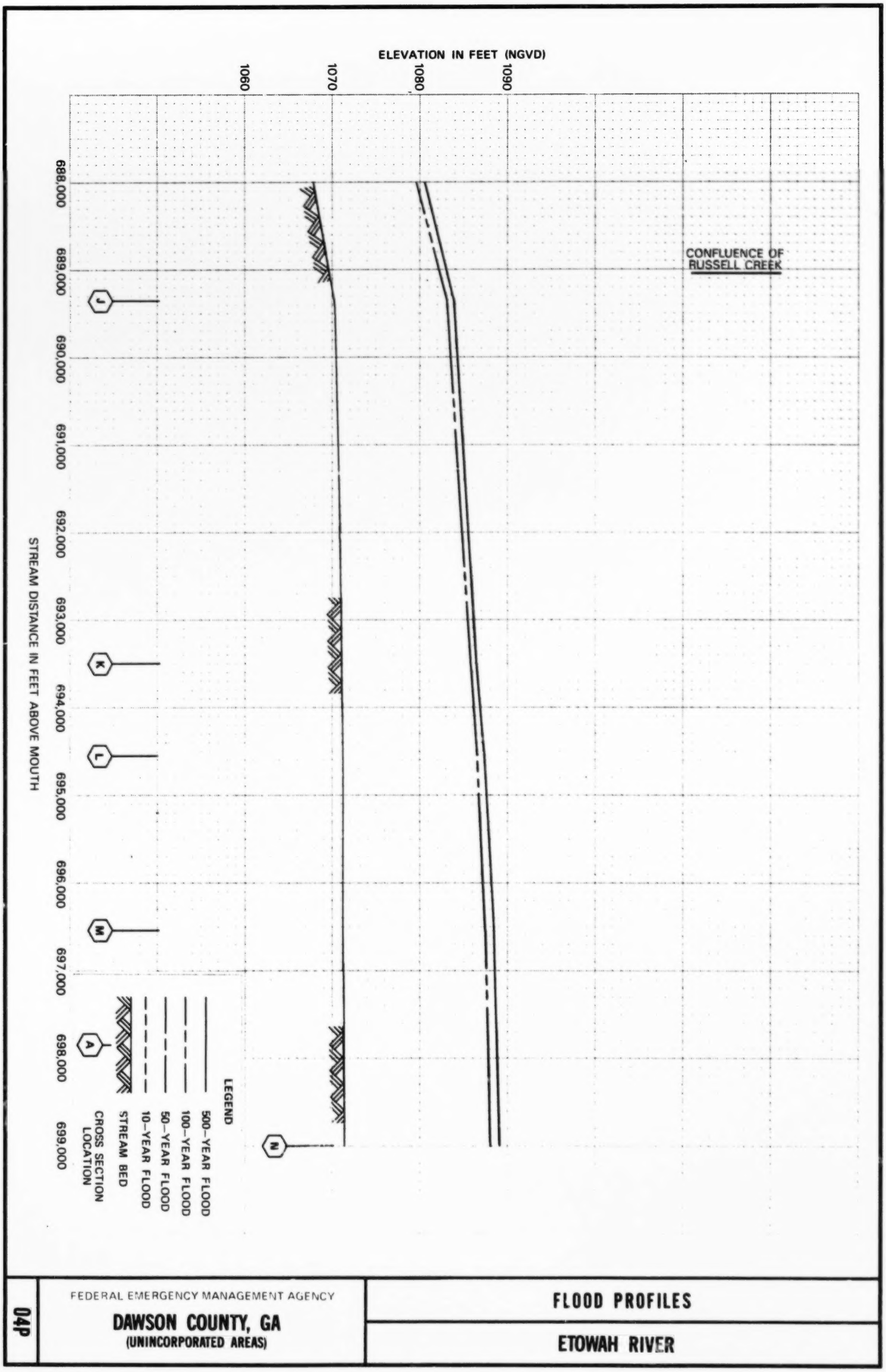
03P

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

FLOOD PROFILES

ETOWAH RIVER



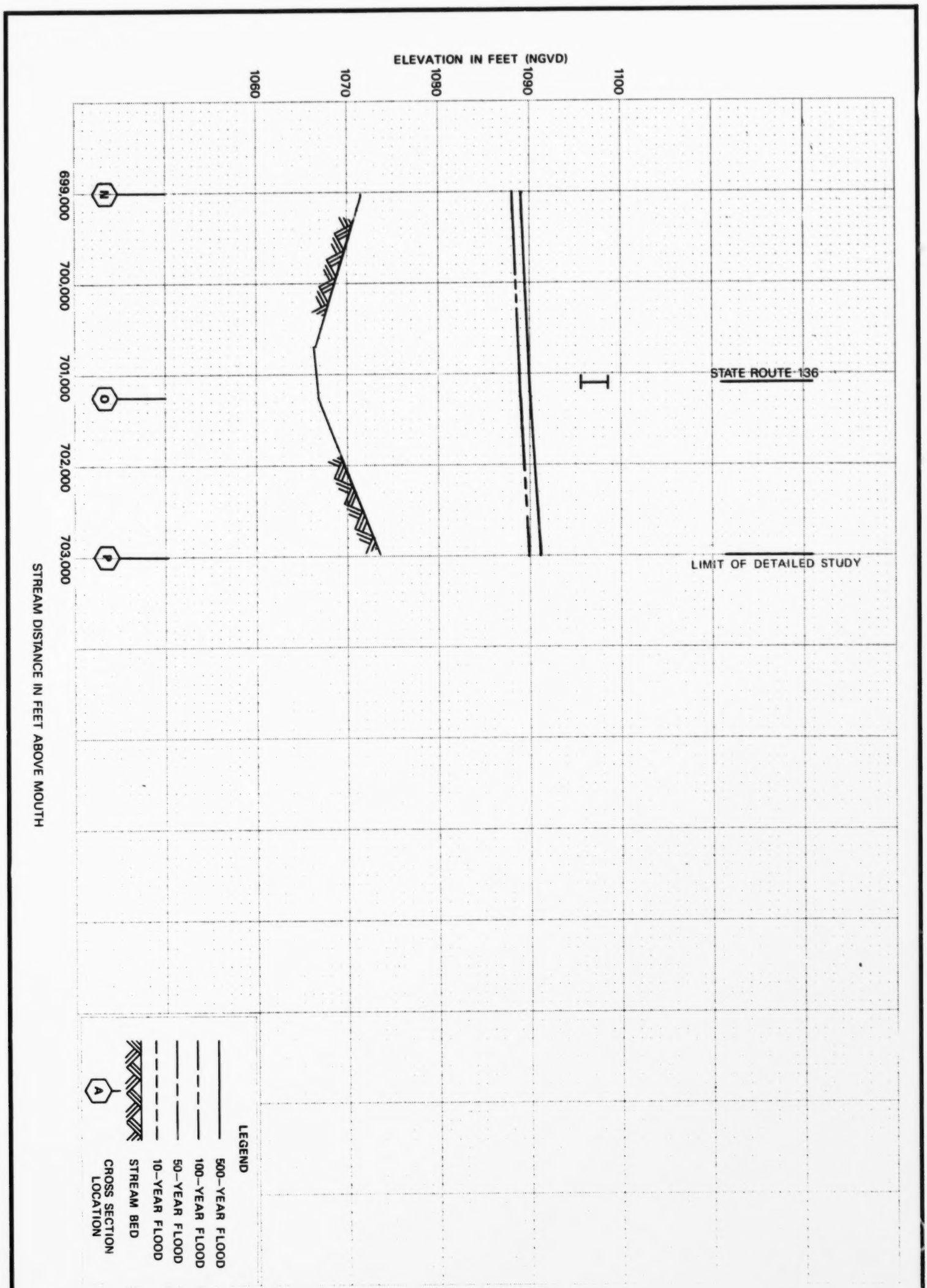
04P

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

FLOOD PROFILES

ETOWAH RIVER



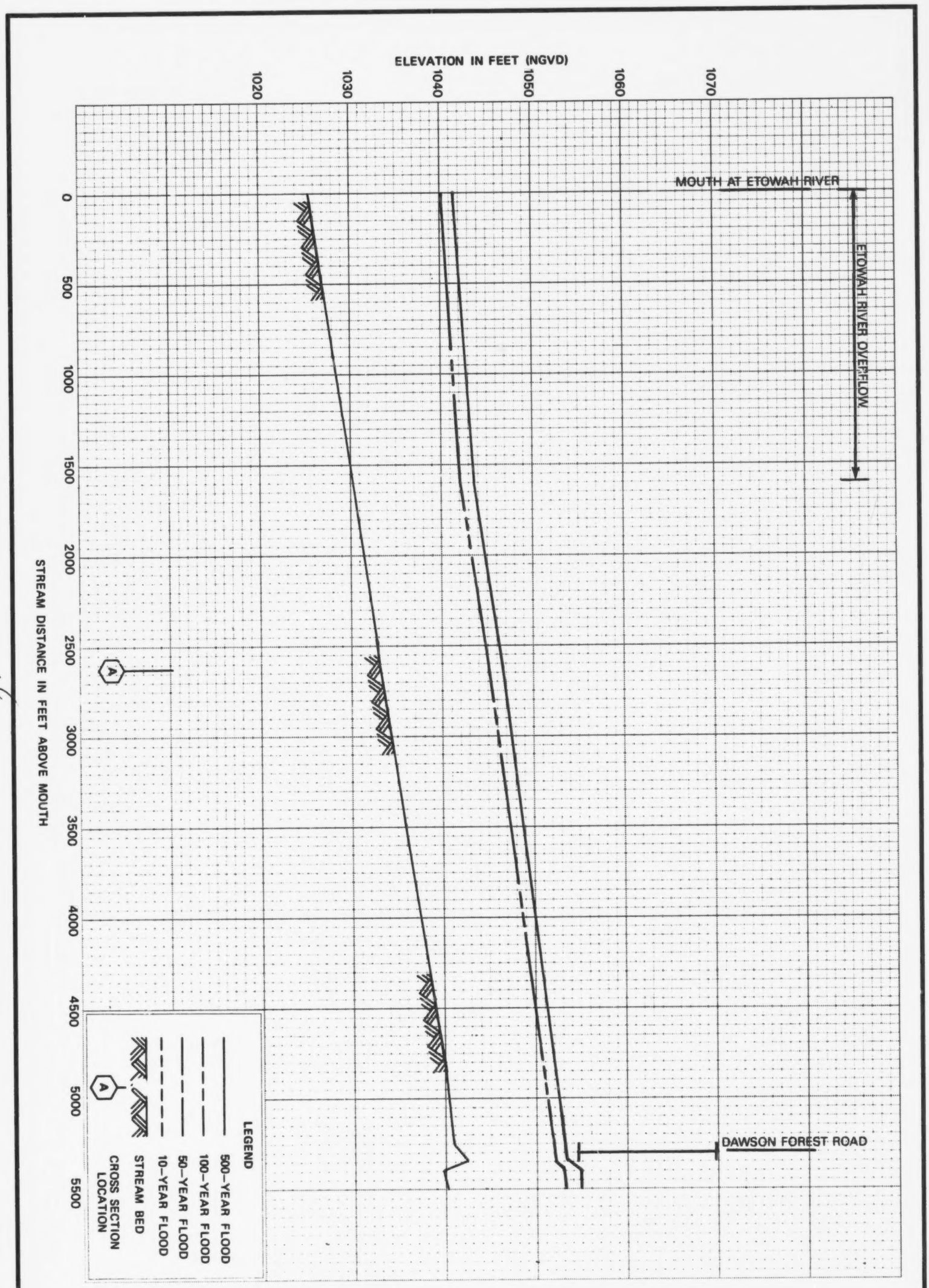
05P

FEDERAL EMERGENCY MANAGEMENT AGENCY

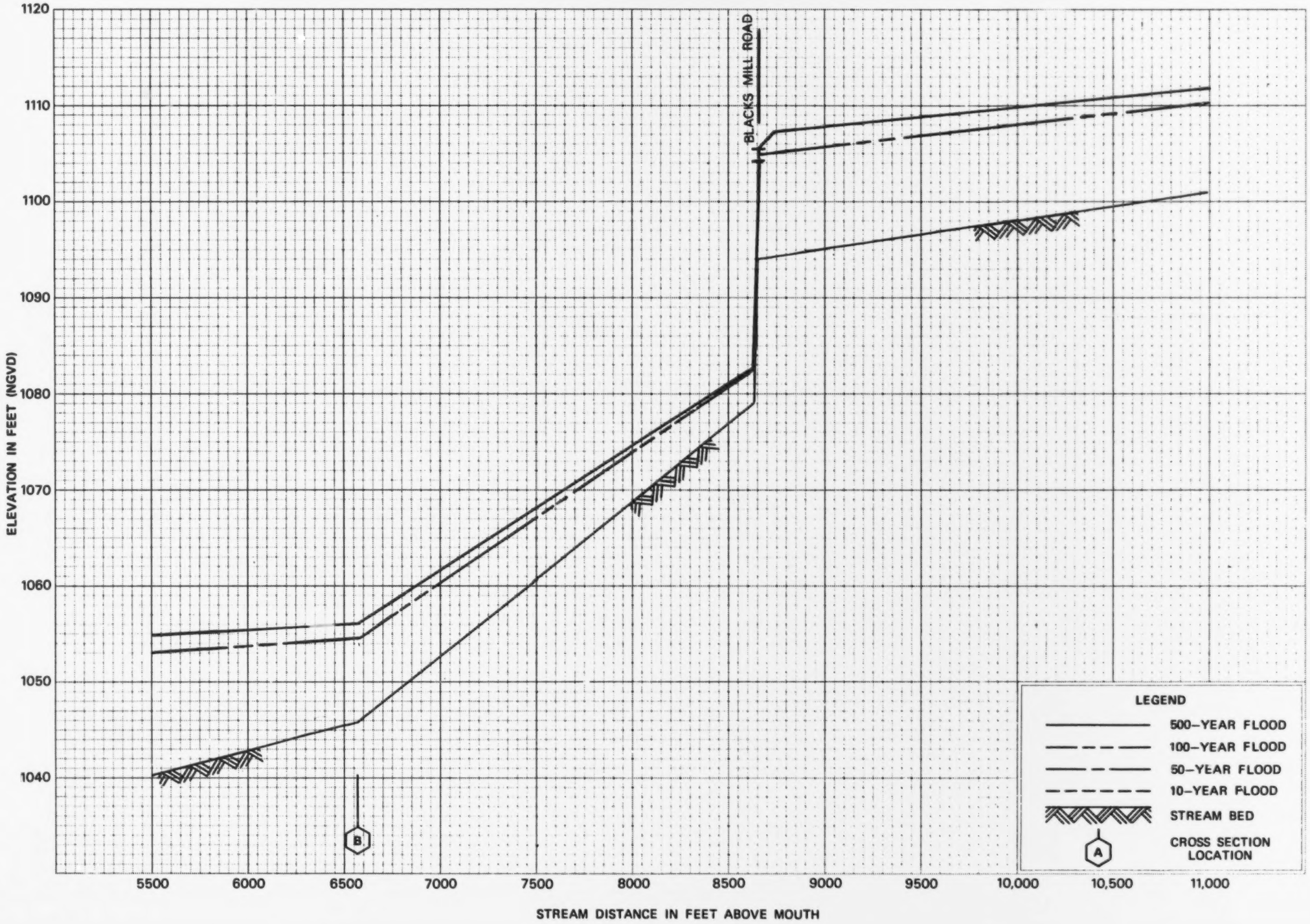
DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

FLOOD PROFILES

ETOWAH RIVER



06P	FEDERAL EMERGENCY MANAGEMENT AGENCY **DAWSON COUNTY, GA** (UNINCORPORATED AREAS)	**FLOOD PROFILES** **BLACK MILL CREEK**



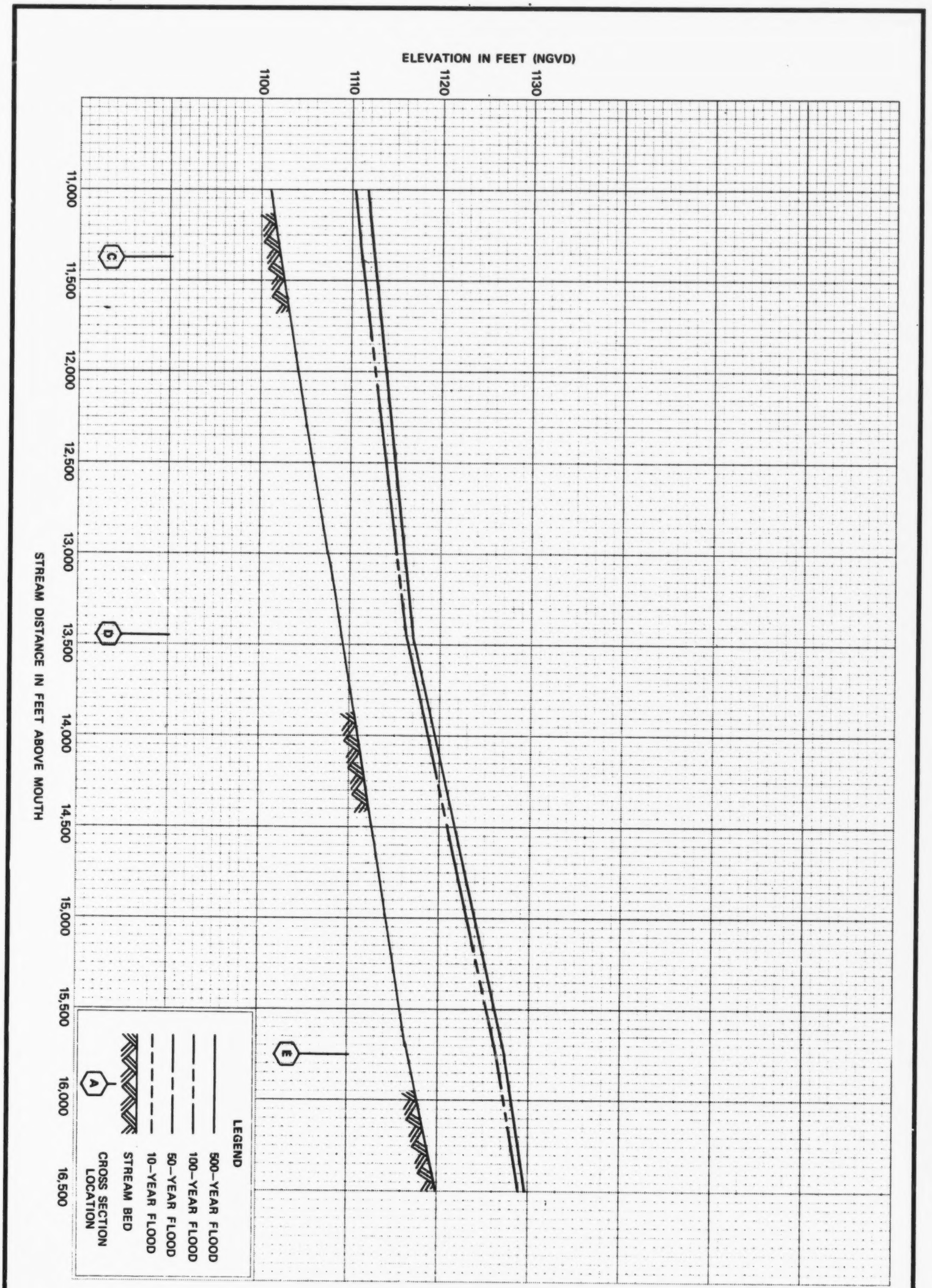
FLOOD PROFILES

BLACK MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

07P



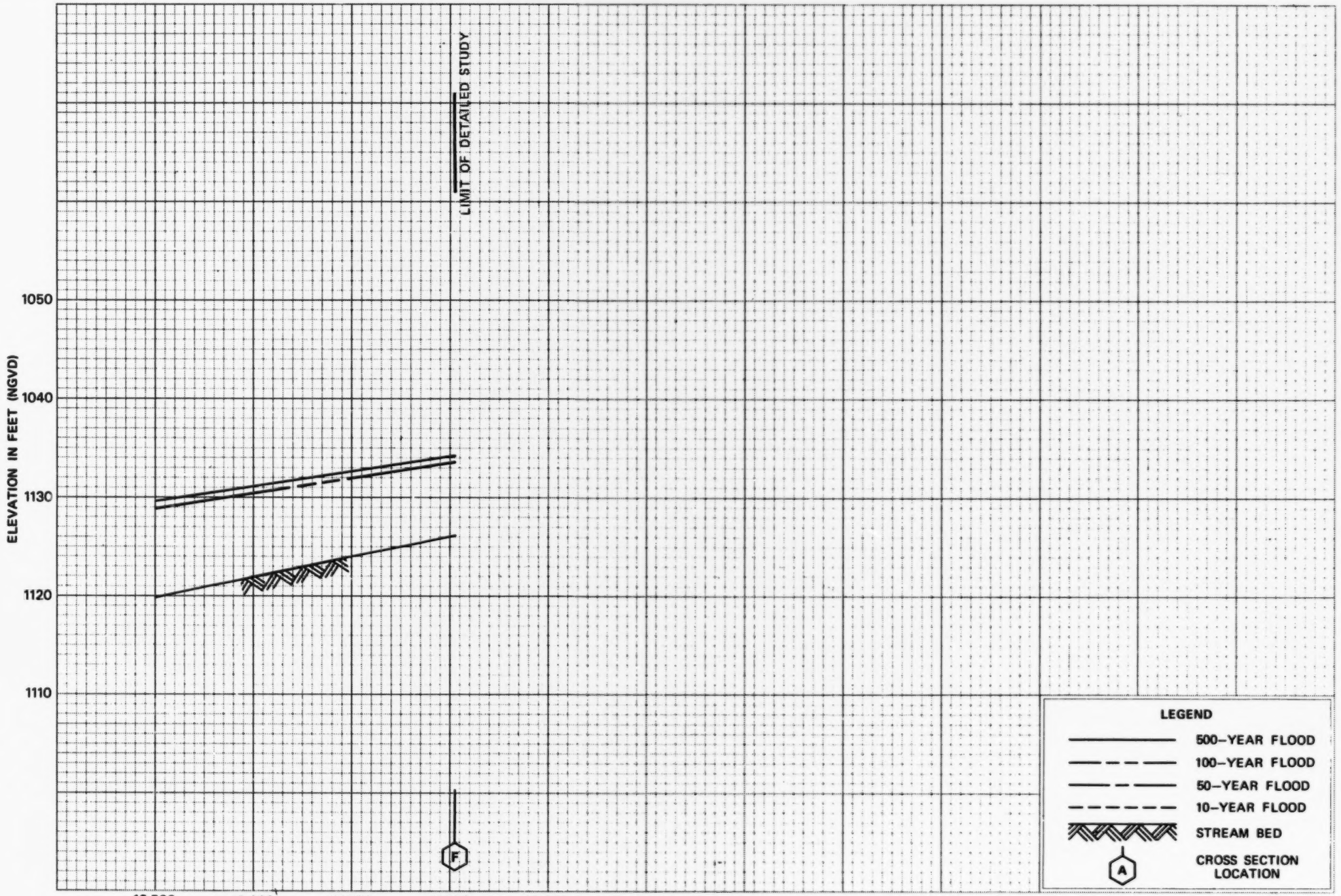
08P

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

FLOOD PROFILES

BLACK MILL CREEK



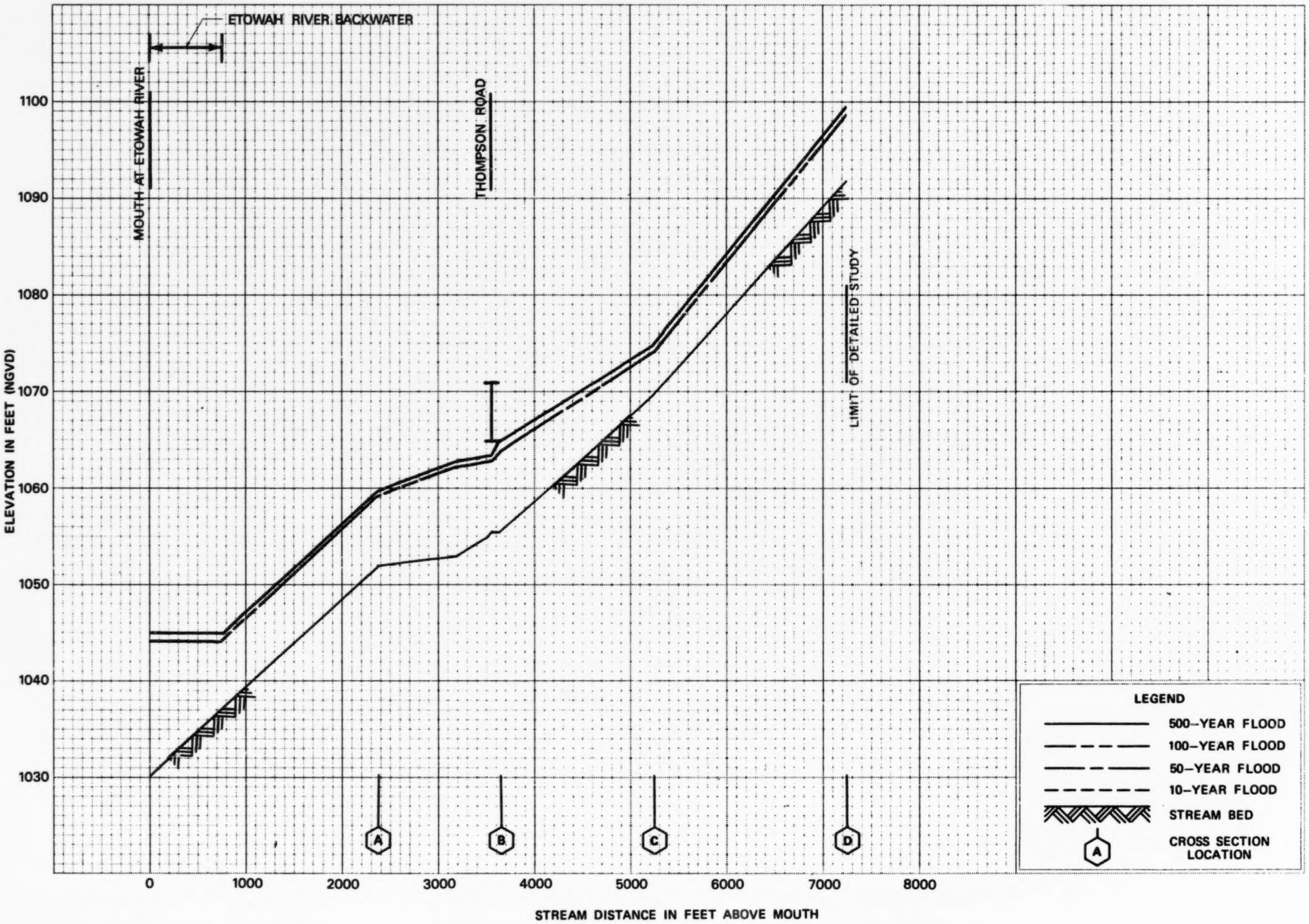
FLOOD PROFILES

BLACK MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

09P



FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

DAWSON COUNTY, GA
(UNINCORPORATED AREAS)

10P